



December 16, 2015

*via electronic mail and U.S. mail to:*

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**Re: Freeport-McMoRan Oil & Gas, LLC, Arroyo Grande Oil Field Aquifer Exemption--  
Dollie Sands, Pismo Formation—USEPA Supplemental Data Request**

Dear Ms. Abel and Mr. Harris,

I am writing in response to Freeport McMoRan Oil & Gas's ("FMOG") supplemental data provided to you on April 28, 2016 regarding the Arroyo Grande Oil Field ("AGOF") aquifer exemption ("Response"). This data was provided in response to a request for additional data from the United States Environmental Protection Agency ("EPA") to the Division of Oil, Gas, and Geothermal Resources ("DOGGR") on April 19, 2016. The Center for Biological Diversity ("Center") has reviewed FMOG's Response, but does not believe it adequately addresses the data requested by EPA or the issues raised in the Center's previous comments on the proposed exemption. Instead, FMOG continues to insist that the agencies trust its inadequate support for its assertion that this aquifer meets both federal and state criteria. Because FMOG is either unable or unwilling to provide the necessary information, we urge DOGGR to withdraw the exemption application.

At the outset, FMOG's assertion that the "federal criteria for making aquifer exemption related determinations do not require an aquifer to be fully contained or isolated" ignores the fact

that California law does require containment and isolation.<sup>1</sup> DOGGR must not and cannot submit a request for exemption to EPA unless and until FMOG demonstrates zonal isolation, including evidence that the injection of fluids will not affect water that may reasonably be used as beneficial use water. Providing this information and analysis is not optional.

As we have previously stated, and as the attached letter from Matt Hagemann, P.G., C.Hg.,<sup>2</sup> reiterates, however, the application still does not contain the necessary hydraulic analysis to ensure zonal isolation or indicate groundwater flow; nor does it provide additional information about nearby water wells. EPA, too, requested specific groundwater flow information (direction and speed), as well as additional information regarding hydraulic isolation, and more details of all current water wells in the area (including the age, owners, production rates, and screened depths).<sup>3</sup>

First, we have previously requested aquifer tests and numeric groundwater models in order to demonstrate the hydrogeology of this and surrounding aquifers. Rather than provide these well-known tests, in response to EPA's request for more information and technical justification regarding the hydraulic regime, FMOG merely referred to the inadequate documentation already in the application and publicly available.<sup>4</sup> This response is wholly insufficient.

Second, while we have previously requested (as did the Regional Water Board)<sup>5</sup> sampling of nearby water wells, FMOG has not yet sampled a single water well. FMOG did conduct a capture zone analysis of 13 wells within 1/4 of a mile, but it ignored EPA's request for a complete inventory of water supply wells.<sup>6</sup> Unfortunately, the capture zone analysis is flawed and, in fact, raises further concerns. As the April 2016 Hagemann letter explains, the capture zone relies on a critical assumption that is not applicable here: that there is an impermeable or no-flow boundary at the fault along the northerneastern border of the oilfield. Because this boundary is "in the same geologic unit that is tapped by drinking water wells just a few hundred feet to the north," conducting "aquifer tests and numerical modeling[] is critical for protection of the adjacent drinking water wells."<sup>7</sup> What is more, the results of the capture zone analysis raise further concern that the drinking water wells are, in fact, "in communication with the exempted area if the fault is transmissive to flow."<sup>8</sup>

FMOG also has not submitted any additional technical support in its Response to support its assertion that the facies change and tar seal are, in fact, impermeable, are further data

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<sup>1</sup> California Public Resources Code §§ 3131(a)(1), (2).

<sup>2</sup> "April 2016 Hagemann letter" (attached).

<sup>3</sup> Letter from Michael Montgomery, US EPA, to Ken Harris, DOGGR (April 19, 2016) ("EPA Request"), p. 2.

<sup>4</sup> Response, A3b.

<sup>5</sup> Central Coast Regional Water Quality Control Board, Order Pursuant to California Water Code section 13267 ("13267 Order") (May 14, 2015), *available at*: [http://geotracker.waterboards.ca.gov/regulators/deliverable\\_documents/9581745982/05-14-2015\\_Freeport-McMoRan%20Oil%2013267.pdf](http://geotracker.waterboards.ca.gov/regulators/deliverable_documents/9581745982/05-14-2015_Freeport-McMoRan%20Oil%2013267.pdf).

<sup>6</sup> EPA Request, p. 4.

<sup>7</sup> April 2016 Hagemann letter, p. 1.

<sup>8</sup> *Id.* at 2.

demonstrating that the tar seal does exist in the place the maps suggest. (As we previously commented, the location of the tar seal is inferred.) FMOG acknowledges this, but states that the “effectiveness and integrity of the seals as containing features is enhanced by prudent operations at the limits of the field such as maintenance of low pressure, and the site specific placement of temperature monitoring wells.”<sup>9</sup> First, replying to EPA’s concern that the analysis is “supplemented by qualitative descriptions of certain operational factors (injection/production volumes and dewatering) that would contribute to hydraulic containment, but no supporting data are provided for these factors,”<sup>10</sup> with more qualitative description is not responsive. Second, replying to EPA’s request for “any supporting data on the operational factors, especially any that could contribute to hydraulic containment of fluids within the proposed exempted area”<sup>11</sup> with publicly available production and injection volumes,<sup>12</sup> but with no analysis of the effects of these volumes, dewatering efforts, or the proposed oil field expansion (which will greatly increase both injection and production volumes) on these factors, is unhelpful at best. Third, reliance on the oil company’s operations to prevent hydraulic communication is not one of the criteria provided for an exemption, nor is it adequate to regulate the practice and protect the public.

Finally, the Center continues to urge DOGGR and EPA to stop granting aquifer exemptions due to the fact that the criteria for granting such exemptions are wholly outdated. They fail to account for technologies developed in the last few decades for purifying and desalinating groundwater, or for the state’s increased need for water in the wake of severe droughts that will continue to increase in frequency and severity due to anthropogenic climate change.<sup>13</sup> Just yesterday, Stanford University researchers released a study documenting more freshwater in California’s aquifers than previously assumed, but noting that a significant amount of oil and gas activity has occurred within freshwater zones and underground sources of drinking water (“USDWS”).<sup>14</sup> The authors’ conclusions included the fact that California does not have complete or current data on its groundwater resources, noting that “[g]roundwater volume estimates in California are uncertain and require additional studies.”<sup>15</sup> The authors further noted that “[c]urrent technologies and growing water demands have made water wells deeper than 1,000 ft more common. . . . As deeper groundwater resources become increasingly important, additional studies are needed for evaluating subsurface activities that could contaminate these resources,” including “wastewater disposal, CO2 storage, and enhanced oil/gas recovery. . . .”<sup>16</sup> Thus, rather than continuing to allow injection and pollution of our state’s most precious resource, the state should invest in understanding and protecting it.

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<sup>9</sup> Response, A1c.

<sup>10</sup> EPA Request, p. 3.

<sup>11</sup> *Ibid.*

<sup>12</sup> Response, A3d and Exhibit A.

<sup>13</sup> See e.g., Williams, Park A. et al., “Contribution of Anthropogenic Warming to California Drought During 2012-2014,” *Geophysical Research Letters*, Vol. 42, Issue 16 (Aug. 28, 2015), pp. 6819-6828.

<sup>14</sup> Kang, Mary and Robert B. Jackson, “Salinity of Deep Groundwater in California: Water Quantity, Quality, and Protection,” *Proceedings of the National Academy of Sciences* (June 21, 2016), doi: 10.1073/pnas.1600400113, available at: <http://www.pnas.org/content/early/2016/06/21/1600400113.full>.

<sup>15</sup> *Id.* at 1.

<sup>16</sup> *Id.* at 2.

Sincerely,



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